optimization criteria for a certain patient regarding election between E or PH boost with similar CTV coverage.

PO-0913

Efficiency of videofluoroscopy to detect radiotherapy and radiochemotherapy-induced swallowing dysfunction

A. Chávez[1], I. Prieto[1], R. Guitiérrez[2], A. Pérez[1]
[1]*Capio - Fundación Jimenez Diaz, Radiation Oncology, Madrid, Spain*
[2]*Capio - Fundación Jimenez Diaz, Otorrinolaryngology, Madrid, Spain*

Purpose/Objective: Head and neck cancer treatment is associated with significant morbidities. Both exclusive radiotherapy (RT) and chemoradiotherapy (CHRT) treatments can produce, as side effects, increased rates of long-term dysphagia. The purpose of the study here presented was to evaluate the ability of videofluoroscopy (VDF) in detecting and measuring swallowing dysfunction secondary to treatments.
Materials and Methods: Eight head-and-neck cancer patients, who underwent radical RT till 70 Gy (5 fractions per week, 2 Gy per fraction), and concurrent chemotherapy (CHT) when indicated, were included. Treatment schedules administered to each patient (RT total dose, radiation fields, delivery techniques, CHT schemes) were decided according the NCCN recommendations. Half of patients received exclusive RT and the other half concomitant CHRT.
In order to evaluate a possible swallowing dysfunction, VDF were performed before and after the treatment. Patients presenting swallowing dysfunction before the treatment were excluded. Post-treatment evaluation was undertaken twice: early (1-3 months) and late post-therapy (4-9 months). The VDF explored swallowing dysfunction with the standard different textures.
Results: Three patients developed some swallowing dysfunction in early post-therapy evaluation and, in the late post-therapy evaluation, 7 patients showed propulsive defect of the pharynx and 6 of them had also residue. Only one patient had symptoms related to this dysfunction. No case of pneumonia by aspiration was reported.
Conclusions: Swallowing dysfunction is a prevalent side effect after intensive RT and CHRT treatment in head-and-neck cancer patients. In our first 8 patients included, most frequent swallowing dysfunction was the propulsive defect of the pharynx asymptomatic in most of the cases. VDF was very effective in detecting, measuring and controlling this side effect. However, in order to confirm these results, inclusion of more patients is required. Therefore, patient enrolment continues.

PO-0914

Quantitative assessment of acute skin erythema and pigmentation due to breast radiation using spectrophotometry

L. Lozza[1], M.C. De Santis[1], M. Carrara[2], T. Rancati[3], T. Giandini[2], E. Pignoli[2], N. Zaffaroni[4], R. Valdagni[5]
[1]*Fondazione I.R.C.C.S Istituto Nazionale Tumori di Milano, Radiotherapy 1, Milan, Italy*
[2]*Fondazione I.R.C.C.S Istituto Nazionale Tumori di Milano, Medical Physics, Milan, Italy*
[3]*Fondazione I.R.C.C.S Istituto Nazionale Tumori di Milano, Prostate Cancer Program, Milan, Italy*
[4]*Fondazione I.R.C.C.S Istituto Nazionale Tumori di Milano, Experimental Oncology and Molecular Medicine, Milan, Italy*
[5]*Fondazione I.R.C.C.S Istituto Nazionale Tumori di Milano, Prostate Cancer Program and Radiotherapy 1, Milan, Italy*

Purpose/Objective: In daily clinical practice, acute adverse skin reactions due to radiation therapy (RT) are graded by the experienced eye of the radiation oncologist. However, such subjective grading provides only rough estimates of RT response. In addition, a great range of skin reactions is observed even between patients undergoing the same treatment. Aim of our study was to implement a quantitative method, based on reflectance spectrophotometry (RS), for objective in vivo measurements of skin erythema and pigmentation due to RT. Correlations between RS measurements and both clinicians' skin toxicity perceptions and delivered superficial doses were investigated.
Materials and Methods: Patients treated with tangential fields to the breast parenchyma were included. RT prescribed dose: 50-60Gy, 2Gy per fraction. Skin RS measurements were obtained by means of a commercially available system (SpectroShade, MHT) which allows to acquire skin reflectance data between 483 and 950nm inside an useful field of view of 18x14mm^2. Measurements were performed before RT and approximately every 6 (range 4-8) RT fractions up to the end of the RT treatment. At the same time, skin acute toxicity grade (ATG) reactions were visually assessed and recorded by the physician using RTOG scoring system.Both instrumental RS measurement and subjective ATG were performed at five different fixed points within the area treated with RT. RS relative changes at two selected band widths centred at 560nm (haemoglobin absorption peak) and720nm (mainly melanin absorption) were analysed and their correlation with ATG and delivered superficial dose was investigated.
Results: Preliminary analysis of measurements at inframammary fold on 11 pts is here presented. SkinRS relative changes at 560nm (RSRC560nm) were a strong indicator of skin erythema and correlated well with clinical ATG evaluation (fig 1a). No evidence of a relationship between superficial absorbed doses (at inframammary fold) and RSRC560nm was obtained. However, after an initial 30Gy irradiation, where patient-to-patient variability to RT resulted to be extremely high, RSRC560nm data clearly indicate the existence of 3 different groups of patients, i.e. over- normal- and under- reacting to RT, with RSRC560nm values <0.6 (3pts), in 0.8-0.9 range (6pts) and >1.1 (2pts), respectively (fig 1b). Finally, skin RS relative changes at 720nm (RSRC720nm) resulted to be mostly related to skin pigmentation and started to slightly modify at the very end of the RT.

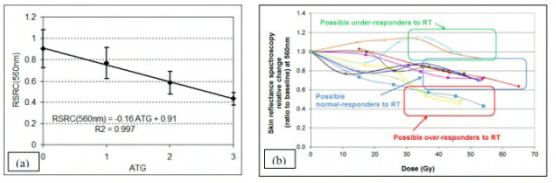

Figure 1: (a) correlation between skin acute toxicity grade (ATG) evaluations and reflectance spectroscopy relative changes measurements centred at 560nm (RSRC560nm); (b) relative skin reflectance (560nm) as a function of dose to the inframammary fold for the 11 considered patients

Conclusions: RS is a good and objective tool to evaluate skin erythema and pigmentation changes. Although preliminary, these data are very interesting and do deserve further investigation. More patients will be recruited to investigate the origin of the variation in patients' radiosensitivity, at the genetic level.
This study was funded by a grant of Mrs M. Bonatti and Mr G. Mameli and by the National Cancer League

PO-0915

High p53 levels after a radiotherapy dose, but not residual DNA DSBs, are associated with late normal tissue reactions

O. Nuta[1], M. Kiang Chua[1], N. Somaiah[2], R. A'Hern[3], A. Pearson[4], J. Warrington[5], R. Owen[6], K. Rothkamm[1], J. Yarnold[7], C. Herskind[8]
[1]*Health Protection Agency, Radiation Effects, Harwell, United Kingdom*
[2]*Gray Institute for Radiation Oncology and Biology, Oncology, Oxford, United Kingdom*
[3]*The Institute of Cancer Research and The Royal Marsden Hospital, Clinical Trials and Statistics Unit, Sutton, United Kingdom*
[4]*The Institute of Cancer Research and The Royal Marsden Hospital, Academic Radiotherapy, Sutton, United Kingdom*
[5]*The Institute of Cancer Research and The Royal Marsden Hospital, Physics, Sutton, United Kingdom*
[6]*Gloucestershire Oncology Centre, Oncology, Cheltenham, United Kingdom*
[7]*The Institute of Cancer Research and The Royal Marsden Hospital, Oncology, Sutton, United Kingdom*
[8]*University Medical Centre, University of Heidelberg, Mannheim, Germany*

Purpose/Objective: This study explores the relationship between the severity of late normal tissue damage in the irradiated breast, i.e. fibrosis leading to breast shrinkage, and the variation in residual DSBs, and in damage response markers (p21 and p53) of dermal fibroblasts isolated from skin biopsies of the patient and irradiated in-vivo or in-vitro.
Materials and Methods: 35 breast cancer patients with minimal (controls) or marked late fibrotic changes in the irradiated breast (cases) were selected 5 to 10 years after postoperative radiotherapy after breast preserving surgery. Skin biopsies of 4 mm diameter were taken 24 h or 12 weeks after irradiation of a field of 4 x 2 cm^2 in the lower back with 4 Gy using 6 MeV electrons. Punch biopsies were taken from both the irradiated and the contralateral unirradiated skin. Primary fibroblast cultures were established by outgrowth from those fresh irradiated and unirradiated skin biopsies which were collected 12 weeks after exposure. Residual DSBs were quantified in tissue sections from irradiated and unirradiated skin as well as in primary fibroblasts cultures which were irradiated in-vitro with 4 Gy as well by scoring 53BP1 foci. P53 and p21 levels were measured in fibroblast cultures.
Results: 24 h after *in-vitro* irradiation the residual number of 53BP1 foci increased compared to levels in unirradiated fibroblast cultures. The increase is larger in fibroblasts isolated from the cases than from the control patients. By contrast, the *in-vivo* irradiated samples which were established 12 weeks after irradiation have essentially the same number of foci as the unirradiated cells. The expression of p53 is